Welding Dictionary

MTE = Miller Technology Exclusive

Select the first letter of the term you are looking for: A C D E F G H I K L M O P R S T V W

A

Accu-Pulse® ***(MTE)*****:** MIG process that delivers precise control of the arc even over tack welds and in tight corners. Provides optimum and precise molten puddle control.

Accu-Rated™ Power ***(MTE)*****:** The standard for measuring engine-driven auxiliary power. Guarantees delivery of all power promised.

Active Arc Stabilizer™ ***(MTE)*****:** Enhances arc starts and provides a softer arc throughout all ranges, with less puddle turbulence and less spatter.

Adaptive Hot Start™ ***(MTE)*****:** Automatically increases the output amperage at the start of a stick weld, should the start require it. Helps eliminate sticking of the electrode at arc start.

Advanced Active Field Control Technology™ ***(MTE)*****:** A simple and reliable patented way of accurately controlling an engine drive's weld output.

Air Carbon Arc Cutting (CAC-A): A cutting process by which metals are melted by the heat of an arc using a carbon electrode. Molten metal is forced away from the cut by a blast of forced air.

Alternating Current (AC): An electrical current that reverses its direction at regular intervals, such as 60 cycles alternating current (AC), or 60 hertz.

Aluminum Pulse Hot Start™ ***(MTE)*****:** Automatically provides more arc power to the Millermatic® 350P to eliminate a "cold start" that is inherent with aluminum starts.

Amperage: The measurement of the amount of electricity flowing past a given point in a conductor per second. Current is another name for amperage.

Arc: The physical gap between the end of the electrode and the base metal. The physical gap causes heat due to resistance of current flow and arc rays.

Arc-Drive ***(MTE)*****:** Automatically enhances Stick welding, especially on pipe, by focusing the arc and preventing the electrode from going out.

Auto-Crater™ ***(MTE)*****:** Allows a TIG arc on the Trailblazer® Series to crater-out, allowing time for the addition of filler, without the loss of shielding gas. Eliminates the need for a remote control at arc end.

Auto-Line™ ***(MTE)*****:** Allows for any primary input voltage within a range, single- or three-phase, 50 or 60 Hz. Also adjusts for voltage spikes within the entire range.

Auto-Link® ***(MTE)*****:** Internal inverter power source circuit that automatically links the power source to the primary voltage being applied (230 V or 460 V), without the need for manually linking primary voltage terminals.

Automatic Start at Idle *(MTE)*: Idles engine immediately when started, extending engine life and reducing fuel consumption and noise.

Automatic Welding: Uses equipment that welds without the constant adjusting of controls by the welder or operator. Equipment controls joint alignment by using an automatic sensing device.

Auto-Refire™ *(MTE)*: Automatically controls the pilot arc when cutting expanded metal or multiple pieces of metal, without manual re-triggering.

Auto Remote Sense™ *(MTE)*: Automatically switches machine from panel to remote control with remote connected. Available on Dimension™ NT 450, XMT® 350, Trailblazer® Series, and PRO 300. Eliminates confusion and need for panel/remote switch.

Auto-Stop™ *(MTE)*: Allows a TIG arc to be stopped without the loss of shielding gas on the Trailblazer® Series.

Axcess™ File Management *(MTE)*: Software that turns a standard Palm handheld into a data card and a remote pendant for all Axcess systems. Allows emailing, storage and transfer of welding programs.

C

Constant Current (CC) Welding Machine: These welding machines have limited maximum short circuit current. They have a negative volt-amp curve and are often referred to as "droopers."

Constant-Speed Wire Feeder: Feeder operates from 240 or 120 VAC supplied by the welding power source.

Constant Voltage (CV), Constant Potential (CP) Welding Machine: This type of welding machine output maintains a relatively stable, consistent voltage regardless of the amperage output. It results in a relatively flat volt-amp curve.

Cool-On-Demand™ *(MTE)*: Integrated cooler runs only when needed on Syncrowave® 250 DX and 350 LX.

Current: Another name for amperage. The amount of electricity flowing past a point in a conductor every second.

D

Defect: One or more discontinuities that cause a testing failure in a weld.

Dig: Also called Arc Control. Gives a power source variable additional amperage during low voltage (short arc length) conditions while welding. Helps avoid “sticking” stick electrodes when a short arc length is used.

Direct Current (DC): Flows in one direction and does not reverse its direction of flow as does alternating current.

Direct Current Electrode Negative (DCEN): The direction of current flow through a welding circuit when the electrode lead is connected to the negative terminal and the work lead is connected to the positive terminal of a DC welding machine. Also called direct current, straight polarity (DCSP).

Direct Current Electrode Positive (DCEP): The direction of current flow through a welding circuit when the electrode lead is connected to a positive terminal and the work lead is connected to a negative terminal to a DC welding machine. Also called direct current, reverse polarity (DCRP).

Dual Power Option™ *(MTE)*: Gives the option on the PipePro® 304 engine drive to use 230 volt single- or three-phase electric input power, eliminating engine wear, noise and emissions, as well as fuel costs.

Duty Cycle: The number of minutes out of a 10-minute time period an arc welding machine can be operated at maximum rated output. An example would be 60 percent duty cycle at 300 amps. This would mean that at 300 amps the welding machine can be used for six minutes and then must be allowed to cool with the fan motor running for four minutes.

E

Engine Save Start™ *(MTE)*: Idles engine three - four seconds after starting on Trailblazer® 275 DC and 302. Extends engine life and reduces fuel consumption.

F

Fan-On-Demand™ *(MTE)*: Internal power source cooling system that only works when needed, keeping internal components cleaner.

FasTip™ Contact Tip *(MTE)*: Patented, single-turn for quick change — no tools needed!

Fixed Automation: Automated, electronically controlled welding system for simple, straight or circular welds.

Flexible Automation: Automated, robotically controlled welding system for complex shapes and applications where welding paths require torch-angle manipulation.

Flux-Cored Arc Welding (FCAW): An arc welding process that melts and joins metals by heating them with an arc between a continuous, consumable electrode wire and the work. Shielding is obtained from a flux contained within the electrode core. Added shielding may or may not be provided from externally supplied gas or gas mixture.

G

Gas Metal Arc Welding (GMAW): See MIG Welding.

Gas Tungsten Arc Welding (GTAW): See TIG Welding.

Ground Connection: A safety connection from a welding machine frame to the earth. See Workpiece Connection for the difference between work connection and ground connection.

Ground Lead: When referring to the connection from the welding machine to the work, see preferred term Workpiece Lead.

Gun-On-Demand™ *(MTE)*: Allows you to use either a standard gun or a Spoolmatic® gun on Millermatic® 210, 251 and 350 without flipping a switch. The machine senses which gun you are using when you pull the trigger.

H

Hertz: Hertz is often referred to as "cycles per second." In the United States, the frequency or directional change of alternating current is usually 60 hertz.

High Frequency: Covers the entire frequency spectrum above 50,000 Hz. Used in TIG welding for arc ignition and stabilization.

Hot Start™ *(MTE)*: Used on some stick (SMAW) machines to make it easier to start difficult-to-start electrodes. Used for arc starting only.

I

Inverter: Power source that increases the frequency of the incoming primary power, thus providing for a smaller size machine and improved electrical characteristics for welding, such as faster response time and more control for pulse welding.

K

KVA (Kilovolt-amperes): Kilovolt-amperes. The total volts times amps divided by 1,000, demanded by a welding power source from the primary power furnished by the utility company.

KW (Kilowatts): Primary KW is the actual power used by the power source when it is producing its rated output. Secondary KW is the actual power output of the welding power source. Kilowatts are found by taking volts times amps divided by 1,000 and taking into account any power factor.

L

Lift-Arc™ *(MTE)*: This feature allows TIG arc starting without high frequency. Starts the arc at any amperage without contaminating the weld with tungsten.

Low OCV Stick™ *(MTE)*: Reduces OCV on several Maxstar® and Dynasty® models when power source is not in use, eliminating need for add-on voltage reducers.

LVC™ (Line Voltage Compensation) *(MTE)*: Keeps the output of a power source constant, regardless of minor fluctuations in input power.

M

Microprocessor: One or more integrated circuits that can be programmed with stored instructions to perform a variety of functions.

MIG Welding (GMAW or Gas Metal Arc Welding): Also referred to as solid wire welding. An arc welding process that joins metals by heating them with an arc. The arc is between a continuously fed filler metal (consumable) electrode and the workpiece. Externally supplied gas or gas mixtures provide shielding.

There are four basic modes of metal transfer:

> ***Short Circuit Transfer:*** *Gets its name from the welding wire actually "short circuiting" (touching) the base metal many times per second. Some spatter is produced, but the transfer can be used in all welding positions and on all thicknesses of metal.*
>
> ***Globular Transfer:*** *Named for "globs" of weld metal transferring across the arc in a gravity feed. Droplets across the arc are usually larger than the electrode diameter. It does not produce a very smooth weld bead appearance, and some spatter can occur. Usually limited to the flat and horizontal welding positions, and not used on thin metals.*
>
> ***Spray Transfer:*** *Named for a "spray" of tiny molten droplets across the arc, usually smaller than the wire diameter. Uses relatively high voltage and amperage values, and the arc is "on" at all times after the arc is established. Very little if any spatter is produced. Usually used on thicker metals in the flat or horizontal welding positions.*
>
> ***Pulsed-Spray Transfer:*** *For this variation of spray transfer, the welding machine "pulses" the output between high peak currents and low background currents. The weld pool gets to cool slightly during the background cycle, making it slightly different than Spray Transfer. This can allow for welding in all positions on either thin or thick metals.*
>
> *For more information on MIG Welding, please see MIG Tech Tips.*

MVP™ (Multi-Voltage Plug) *(MTE)*: Allows connection of Millermatic® DVI™ or Passport™ to 115- or 230-volt receptacles without tools — just choose the plug that fits the receptacle.

O

Open-Circuit Voltage (OCV): As the name implies, no current is flowing in the circuit, because the circuit is open. The voltage is impressed upon the circuit, however, so that when the circuit is completed, the current will flow immediately.

P

Palm™ OS Compatibility: Replaces the need for data cards and remote control pendants on Axcess models.

Plasma Arc Cutting: An arc cutting process that severs metal by using a constricted arc to melt a small area of the work. This process can cut all metals that conduct electricity. For more information on Plasma Cutting, please see Plasma Tech Tips.

Pounds Per Square Inch (psi): A measurement equal to a mass or weight applied to one square inch of surface area.

Power Efficiency: How well an electrical machine uses the incoming electrical power.

Power Factor Correction: Normally used on single-phase, constant current power sources to reduce the amount of primary amperage demanded from the power company while welding.

Primary Power: Often referred to as the input line voltage and amperage available to the welding machine from the shop's main power line. Often expressed in watts or kilowatts (KW), primary input power is AC and may be single-phase or three-phase.

Pulsed MIG (MIG-P): A modified spray transfer process that produces no spatter, because the wire does not touch the weld puddle. Applications best suited for pulsed MIG are those currently using the short circuit transfer method for welding steel, 14 gauge (1.8 mm) and up.

Pulsed TIG (TIG-P): A modified TIG process appropriate for welding thinner materials.

Pulsing: Sequencing and controlling the amount of current, the frequency and the duration of the welding arc.

R

Rated Load: The amperage and voltage the power source is designed to produce for a given specific duty cycle period. For example, 300 amps, 32 load volts, at 60 percent duty cycle.

Regulated Metal Deposition (RMD®) *(MTE)*: Precisely controlled short-circuit transfer technology, available as an option on Axcess® models. For spatter reduction, up to 20 percent reduced heat input, or filling gaps.

Resistance Spot Welding (RSW): A process in which two pieces of metal are joined by passing current between electrodes positioned on opposite sides of the pieces to be welded. There is no arc with this process. For more information on Resistance Spot Welding, please see Resistance Spot Welding Tech Tips.

RMS (Root Mean Square): The "effective" values of measured AC voltage or amperage. RMS equals 0.707 times the maximum or peak value.

S

Semiautomatic Welding: The equipment controls only the electrode wire feeding. The welding gun movement is controlled by hand.

SharpArc® *(MTE)*: Optimizes the size and shape of the arc cone, bead width and appearance, and puddle fluidity. Available on the Millermatic® 350/350P.

Shielded Metal Arc Welding: See Stick Welding.

Shielding Gas: Protective gas used to prevent atmospheric contamination of the weld pool.

Single-Phase Circuit: An electrical circuit producing only one alternating cycle within a 360-degree time span.

Smart Fuel Tank *(MTE)*: Tank's design minimizes chance of fuel backflow.

Spatter: The metal particles blown away from the welding arc. These particles do not become part of the completed weld.

Spot Welding: Usually made on materials having some type of overlapping joint design. Can refer to resistance, MIG or TIG spot welding. Resistance spot welds are made from electrodes on both sides of the joint, while TIG and MIG spots are made from one side only.

Squarewave™: The AC output of a power source that has the ability to rapidly switch between the positive and negative half cycles of alternating current.

Stick Welding (SMAW or Shielded Metal Arc): An arc welding process that melts and joins metals by heating them with an arc, between a covered metal electrode and the work. Shielding gas is obtained from the electrode outer coating, often called flux. Filler metal is primarily obtained from the electrode core. For more information on Stick Welding, please see Stick Tech Tips.

Submerged Arc Welding (SAW): A process by which metals are joined by an arc or arcs between a bare metal electrode or electrodes and the work. Shielding is supplied by a granular, fusible material usually brought to the work from a flux hopper.

Sun Vision™ *(MTE)*: Allows easy reading of digital meters in direct sunlight or shade on Trailblazer® 275 DC and 302.

SureStart™ *(MTE)*: Provides consistent Axcess® arc starts by precisely controlling power levels for specific wire and gas combinations.

Syncro Start™ *(MTE)*: Allows selectable customized arc starts on Syncrowave® 200, 250 DX and 350 LX

T

Three-Phase Circuit: An electrical circuit delivering three cycles within a 360-degree time span, and the cycles are 120 electrical degrees apart.

TIG Welding (GTAW or Gas Tungsten Arc): Often called TIG welding (Tungsten Inert Gas), this welding process joins metals by heating them with a tungsten electrode, which should not become part of the completed weld. Filler metal is sometimes used and argon inert gas or inert gas mixtures are used for shielding. For more information on TIG Welding, please see TIG Tech Tips.

Tip Saver Short Circuit Protection™ *(MTE)*: Shuts down output when the MIG contact tip is shorted to the work, on the Millermatic® 135 and 175. Extends contact tip life and protects machine.

Trigger Reset: Permits quick reset at gun rather than at machine.

Torch: A device used in the TIG (GTAW) process to control the position of the electrode, to transfer current to the arc and to direct the flow of the shielding gas.

Torch Detection™ *(MTE)*: Syncrowave® 250 DX and 350 LX detect if TIG torch is water- or air-cooled.

Touch Start: A low-voltage, low-amperage arc starting procedure for TIG (GTAW). The tungsten is touched to the workpiece; when the tungsten is lifted from the workpiece an arc is established.

Tri-Cor™ Technology *(MTE)*: Stabilizer design on the Bobcat™ 250 that delivers smoother welds and decreased spatter with E7018 electrodes, without sacrificing performance with E6010 electrodes.

Tungsten: Rare metallic element with extremely high melting point (3410° Celsius). Used in manufacturing TIG electrodes.

V

Voltage: The pressure or force that pushes the electrons through a conductor. Voltage does not flow but causes amperage or current to flow. Voltage is sometimes termed electromotive force (EMF) or difference in potential.

Voltage-Sensing Wire Feeder: Feeder operates from arc voltage generated by welding power source.

Volt-Amp Curve: Graph that shows the output characteristics of a welding power source. Shows voltage and amperage capabilities of a specific machine.

W

WaveWriter™ File Management *(MTE)*: Includes all Axcess™ file management functions, plus a simple, graphical wave-shaping program for the most demanding pulsed MIG applications.

Weld at Idle™ *(MTE)*: Allows PipePro™ 304 to automatically weld at a quieter, lower RPM, using less fuel. When more output is required, the machine goes to high speed without a change in arc.

Weld Metal: The electrode and base metal that was melted while welding was taking place. This forms the welding bead.

Weld Transfer: Method by which metal is transferred from the wire to the molten puddle.

Wet-Stacking: Unburned fuel and engine oil collecting in the exhaust stack of a diesel engine, characterized by the exhaust stack being coated with a black, sticky, oily substance. The condition is caused by the engine being run at too light of a load for extended periods of time. Caught early, this does not cause permanent damage and can be alleviated if additional load is applied. If ignored, permanent damage can occur to the cylinder walls and piston rings. Improved emission standards and higher quality fuel make engines less prone to wet-stacking in recent years.

Wind Tunnel Technology™ *(MTE)*: Internal airflow on many Miller inverters, that protects electrical components and PC boards from contamination, significantly improving reliability.

Wire Feed Speed: Expressed in in/min or mm/s, and refers to the speed and amount of filler metal fed into a weld. Generally speaking, the higher the wire feed speed, the higher the amperage.

Workpiece Connection: A means to fasten the work lead (work cable) to the work (metal to be welded on). Also, the point at which this connection is made. One type of work connection is made with an adjustable clamp.

Workpiece Lead: The conductor cable or electrical conductor between the arc welding machine and the work.

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